



## Relation of Prediagnostic Serum Estrogen and Androgen Levels to Breast Cancer Risk

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**Abstract:** To evaluate the relation of serum sex hormones to breast cancer risk, we conducted a prospective nested case-control study using the Breast Cancer Serum Bank (Columbia, MO). This bank included serum from 3375 postmenopausal women free of cancer and not taking replacement estrogens when they donated blood between 1977 and 1987. Of these, 71 were diagnosed subsequently with breast cancer. For each case, two women alive and free of cancer at the age of the case's diagnosis and matched to the case on age and on date and time of day of blood collection were selected as controls. The median age of subjects at blood collection was 62 years, and the time from blood collection to diagnosis ranged from less than 1 to 9.5 years, with a median of 2.9 years. Postmenopausal women with elevated serum levels of total and non-sex hormone-binding globulin-bound E2 were at an increased risk of developing breast cancer. For non-sex hormone-binding globulin-bound E2, risks were elevated 4-5-fold for women in the upper three quartiles relative to those in the lowest quartile. Although breast cancer was not related to estrone or estrone sulfate concentration, the ratio of estrone sulfate to estrone was significantly inversely associated with risk, suggesting that women who develop breast cancer may be less able to metabolize estrone to its less active form. Serum testosterone was significantly positively associated with postmenopausal breast cancer; the relative risk for women in the highest *versus* the lowest quartile was 6.2 (95% confidence interval, 2.0-19.0). Our results support the hypothesis that prediagnostic serum estrogens and androgens are related to the subsequent diagnosis of breast cancer in postmenopausal women.